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DR. BOEHM-BAWERK'S THEORY OF INTEREST.

In undertaking to write of the new theory of interest presented by Dr. Böhm-Bawerk, of Austria, I desire to say in advance that I have never made a special study of capital and interest, and must therefore speak with diffidence regarding it; and, secondly, that I am not sure I understand all that Dr. Böhm-Bawerk says, and cannot feel confident that my criticisms may not be misdirected. Whatever ability I may have as an economist does not lie on the side to which this subject takes me. Certainly, I have no desire to misrepresent Dr. Böhm-Bawerk; nor have I any self-love concerned in the issue, inasmuch as my peculiar views of the distribution of wealth are not at all involved.

I. Turning now to Dr. Böhm-Bawerk's critical history of interest theories, I feel moved to say that it does not seem to me that the author is justified in his very elabo-

rate treatment of the economists, from Adam Smith down, as dealing with the matter of interest; in his multiplication of formal distinctions; in his classification of interest theories. The whole book appears to me badly conceived, though every one must admit that the plan has been executed with wonderful acuteness, wit, and felicity of illustration.

Dr. Böhm-Bawerk finds in the economists of England, France, and Germany a great number of differing theories of interest. The literature of interest, he declares, is equalled by the literature of no other department of political economy "in the variety of opinion it presents. Not one, or two, or three, but a round dozen of interest theories testify to the zeal," etc. He speaks of the "numerous views advanced as to the nature and origin of interest," of a "motley collection of the most conflicting opinions," and the like. Even after combining these views according as they have more or less in common, he makes out three considerable groups of interest theories, not counting Turgot's Fructification theory, or those which he calls the colorless theories, or the socialist Exploitation theory.

I am not disposed to deny that, of the many scores of writers whose works Dr. Böhm-Bawerk has searched for this purpose, enough have expressed themselves with sufficient looseness on the subject of the economic function of capital and the origin of interest, to enable Dr. Böhm-Bawerk to construct this elaborate classification and to justify it by an abundant display of quotations. But is this good criticism? Is it good history? We all know that the temptation is strong in controversy, especially in dealing with a book coming fresh from the press and challenging the attention of a contemporaneous audience, to hold authors strictly to account for what they say. In this way we force them to correct their statements, if in any degree inaccurate, to the advantage of later editions

and later works. In this way, too, we, perhaps somewhat rudely and unkindly, help them to see for themselves a little more clearly what they do mean,—possibly, show them that they do not mean anything at all. But this is not criticism, in any high sense. Certainly, it is a particularly poor kind of history. A critical history of opinion should seek to interpret men's utterances, not to catch them up on their deficiencies of statement or blunders of expression. It should seek to set forth, tolerantly and sympathetically, what they really meant and tried to say. It does not seem to me that Dr. Böhm-Bawerk has performed his work in this spirit.

Let me at once offer an illustration of the objection I take to Dr. Böhm-Bawerk's entire procedure, in the single case of Lord Lauderdale. Lord Lauderdale's view was, in general, that interest is paid out of the wages of the laborers whose services are dispensed with by the use of capital. The illustration he offers is that of a knitting machine, newly brought into use, which does the work formerly done by six hand laborers. One laborer is required to tend the machine. The interest paid for the use of the capital so invested may, Lord Lauderdale thinks, be regarded as paid out of what would otherwise have been the wages of the five men whose services are thus dispensed with. I say the interest is paid out of the sum thus put at disposal; for Lord Lauderdale recognized the fact that, except in the case of monopolies and patents, the return to capital will not amount to the whole of this sum. Under the normal operation of economic forces, the multiplication of the new machines will go forward until the profits of their use will be reduced to a point which corresponds to the general profit derived from the application of capital in that community.

Upon this how does Dr. Böhm-Bawerk treat Lord Lauderdale? Quoting the illustration given, he admits that there is in the machine what he calls a physical

productivity; that is, a power of producing a greater number of goods. He is willing, also, to concede that the greater number of goods will represent a greater value. But, he asks, has Lord Lauderdale shown that this resulting value will be greater by so much as the cost of the machine (to replace the capital invested), and by something more (to yield interest)? If, he says, the machine lasts only one year, may it not be that the sum which would have otherwise been paid to the workmen displaced (and thus available, in Lord Lauderdale's view, for possible interest) will be found to be less than the cost of building the machine? And, since Lord Lauderdale has not expressly covered this point, has not taken the trouble to say that the machine would last twelve or twenty years, and would replace an amount of wages which would be twenty or fifty times its own cost, Dr. Böhm-Bawerk proceeds thereupon to assign Lord Lauderdale to the class holding what he calls the Naïve Productivity theory of interest, consisting of those who "simply state that capital is productive; adding, perhaps, a very superficial description of its productive efficiency, and hastily conclude by placing surplus value to the account of the asserted productive power." Had Lord Lauderdale gone on with his illustration, to state the terms under which the machine would not only have produced a greater quantity of goods, of a greater aggregate value, but would during its life have repaid its own cost of construction, with something more, he would then have had the honor of figuring in Dr. Böhm-Bawerk's classification as belonging to the group of Indirect Productivists, to whom the critic assigns a higher place, and to whom he accords a far more respectful treatment.

Now, I ask, is this criticism? Is this critical history? Does any one doubt that Lord Lauderdale had in view a case where the value of the machine was fully repaid by the sum of its uses, and far more? Lord Lauderdale was

a statesman and man of affairs, writing for men of affairs. He was speaking to a constituency which was familiar with the wonders of the power-loom and the spinning-jenny. He no more thought it necessary to guard himself against a possible critic by distinctly stating that the knitting machine in question repaid its cost of construction, than one would, after describing a man as struck in the breast by a shell from a one-hundred-and-ten-ton gun, deem it necessary to go on to state that the unfortunate subject of the impact did not long survive the shock. Dr. Böhm-Bawerk himself says in this connection: "I grant that experience goes to show that machines and real capital in general, be their monopoly price forced up ever so high, never cost quite as much as they turn out. But this is only shown by experience, not by Lauderdale." But, if such a result is shown by universal experience, what need for Lauderdale to show it? Why might he not fairly assume it? If in a critical history of opinion men are to be judged and ranked according to what they thought and had in mind, and not according to their deficiencies of statement and blunders of expression, I think we cannot but hold Dr. Böhm-Bawerk's discussion of Lord Lauderdale's view of interest to be bad criticism. And what is complained of in this case seems to be characteristic of at least a large part of this work.

For one, I do not believe that a single writer of any one of the three classes brought by Dr. Böhm-Bawerk into his Productivity group of interest theories held any other opinion than that to which Dr. Böhm-Bawerk accords the highest degree of respect; that is, the Indirect Productivity view of interest. For instance, among the Naïve Productivists Dr. Böhm-Bawerk makes out a body of writers as holding the opinion that capital has a direct value-producing power. These writers constitute one of his formulated classes; and it is to be admitted that those very terms are used by many. Yet, for myself, I do not

believe that a single one of them meant anything more, or anything less, than that the use of capital in production contributes to the creation of a larger amount of goods of a larger aggregate value. If Dr. Böhm-Bawerk's object was to show how badly or loosely a great many writers have expressed themselves (though whether that would be worth doing might still be in question), he has done his work well. If his object was criticism and history, I cannot think he has done it well. So much for the Productivists.

There is, in Dr. Böhm-Bawerk's treatment, another large group (divisible, like the Productivists, into classes) which he characterizes as holding the Abstinence theory of interest. To these economists he attributes the opinion that abstinence from immediate consumption directly creates interest; and it is to be admitted that there is enough in their writings to justify such an assertion, if that is the sort of thing you are trying to do. Yet I do not believe that a single one of these writers ever held such an opinion in any other sense than that the saving up of wealth enables the capital to be accumulated which, through its application to production, causes the creation of a greater quantity of goods, of a higher aggregate value. The simple fact is that the writers whom Dr. Böhm-Bawerk thus characterizes were engaged in defending interest on moral, political, and economic grounds, vindicating it both as an institution beneficial to society and as an arrangement consistent with political justice. Approaching the subject from this point of view, and writing for a present constituency concerned with these questions, it not unnaturally resulted that they dwelt upon the moral and economic virtue involved in abstaining from the immediate consumption of costly and pleasant things for the sake of a future good and to the manifest benefit of the community. They thus reached a social justification of interest, which no one of them probably ever mistook for

a scientific ascertainment of the cause of interest. So much for the Abstinence group. As to the third great group, the Use group of theories as to the origin of interest, even Dr. Böhm-Bawerk's translator, editor, and hearty admirer, revolts. "I confess," says Mr. William Smart, "I find some difficulty in stating the economic argument of what our author has called the Use theory of interest; and I am almost inclined to think that he has done too much honor to some economists in ascribing to them this theory." I can't say about the honor; but I agree with Mr. Smart so far as to believe that no economist of rank, who had given more than a passing thought to interest, ever held any of the ingenious Use theories stated by Dr. Böhm-Bawerk in any other sense than that the use of capital is productive, as the Productivists employ that term.

II. So much for our author's treatment of the economists and his classification of their opinions regarding interest.

Let us now pass to what he has to say regarding the economic function of capital and the relation of capital to other elements in production. In opening the path to his demonstration of the origin of interest, Dr. Böhm-Bawerk deems it necessary to give a very disparaging expression to the part which capital takes in production. It is usual to speak of it as one of three equal and independent agents in production, having a corresponding share assigned to it in distribution; *i.e.*,

land,	receiving	rent.
labor,	"	wages.
capital,	"	interest.

(The reader may be aware that, in my theory, I adduce a fourth agent of production; namely, business ability, receiving profits. But this is not important to the present discussion; and I will not obtrude that feature here.)

Now, Dr. Böhm-Bawerk says that the framing of the left-hand list embodies an error, due to the natural feeling that there must be a distinct agent in production corresponding to that undoubted share in distribution known as interest. You have interest: *ergo*, capital must be placed against it,. to account for it. But Dr. Böhm-Bawerk declares that there is no such original and independent agent of production. Production has only two technical elements,—the powers of nature and human labor. Capital is wholly derivative and secondary,—the product of man working upon nature. Thus, while there is such a share in distribution as interest, there is no corresponding factor in production. I confess I do not see the importance of this. Whether capital, as an element of production, be derivative and secondary or original and independent, does not affect the inquiry how interest on capital is generated, out of what fund it is paid, from what source it springs. But Dr. Böhm-Bawerk evidently considers this a fundamental matter in his great argument. He has to do away with a prejudice, as he conceives it, in favor of capital, which predisposes the mind easily to accept a false view of interest. He has to remove the notion that, just as land produces its own rent, just as labor produces its own wages, so capital produces its own interest. To remove this preconception, he seeks to overthrow capital as a technical element, or factor, in production, of the same grade or rank as land and labor. So, he repeats, we have only two original and independent agents of production; namely, nature's powers and man's powers.

But what about horse powers and mule powers and ox powers? In almost all communities there is as much of muscular power belonging to brute animals available for production (and often very much more) as of muscular power belonging to man. Where does Dr. Böhm-Bawerk place these powers in relation to nature's powers and

man's powers? Of course, the reader deems my question idle, and the answer easy. The powers of cattle and horses are derived from nature, with or without the care and labor of man. The muscular powers of the horse, *e.g.*, represent so much of vegetable material gathered by the animal himself or provided by man. Grasses or nutritious roots have been transmuted, by nature's wonderful alchemy, into bone and muscle. That is true enough. The answer to my idle question has been easy and conclusive. The answer to my next question will not be so easy. If Dr. Böhm-Bawerk treats the laboring powers of horses and cattle as derived from the powers of nature, why does he not refer the laboring powers of man himself to the same source? What is man's bone and muscle but vegetable and animal matter wrought upon by nature's wonderful alchemy? There is not the faintest shadow of a reason for referring the laboring powers of brutes to nature, and not referring those of man also. Nay, not only must man's powers be deemed to be derivative and secondary if the powers of the useful animals are to be so treated, but, as a matter of fact, the brutes were the first to be created; and hence man's powers are derivative and secondary in an even higher degree than the powers of the ox and the ass. Whether you follow Moses or Monboddo or Darwin, you come to the same conclusion. It was the brute animals that were first created. They were on the earth when man appeared upon it; and it was their milk, their meat, their muscular help, which kept man alive in the early stages of his helplessness and ignorance. So much for Dr. Böhm-Bawerk's effort to set capital beneath nature and man as agents of production. It only results in showing some forms of capital as older than man himself, and as playing an important part in nursing man and keeping him alive through the infancy of the race.

But what, after all, does it matter, for the problem of

distribution, whether capital be derivative or original? At any given time, in any given place, there are three great agents of production ready to be set to work (according to my view, four; but never mind that now),— nature's powers (land), capital, man's powers (labor). In the situation then and there existing, these powers, whether all original or not, are independent and equal. They must be brought together, if at all, by consent and contract. Each will contribute an all-important part to production. Each will claim and receive a share of the product. And for none of the purposes of that partition does it matter a pin whether one of these powers was, in its source, different from the others. It is the origin of interest, not the origin of capital, with which we are concerned.

III. Let us now pass to consider Dr. Böhm-Bawerk's positive theory of capital-interest. And here I must repeat that I shall speak under the constant feeling that I may be wrong; that perhaps I do not clearly comprehend the author's meaning, or in my own reply may be beyond my depth. What, substantially, is Dr. Böhm-Bawerk's theory of interest? It is that interest is wholly due to an undervaluation of future goods. "The loan," he says, "is a real exchange of present goods against future goods." For this purpose "present means of production are, in effect, future goods." In Mr. Smart's phrase, "the essence of interest is discount." The following is the fuller statement: —

Whether from the difference in men's resources in the present and in the future, respectively, or from their tendency to undervalue future joys and sorrows, or else from regard to the technical superiority of present over future goods, in any case the overwhelming majority of human beings set a higher subjective value on present than on future goods otherwise identical. From such subjective valuations arise, in the general market, a higher objective value in exchange, and higher price for present goods. The said higher objective value and price react upon subjective valuations; and this gives to

present goods a higher subjective value in exchange, even with those persons for whom (through their personal circumstances) such higher subjective value would not otherwise have existed. Finally, the levelling tendencies of the market make the depreciations of future goods bear a regular proportion to the degree of futurity. Accordingly, in the economy of nations, future goods are depressed, both in subjective and in objective value, more or less deeply in proportion as they are more or less remote from the present.

In a word, the reason why a man who loans $100 is to receive back $106 at the end of the year is not because the capital loaned will produce $6 worth or more during the year, besides keeping itself up, but solely because men think as much of $100 now as of $106 available a year hence. What shall we say of this? That there is a strong tendency in human nature to undervalue the future, in comparison with the present, is clear. The Productivists recognize this, and give it a place in their theory. They use the fact as affecting the supply of capital, through controlling the disposition to save and accumulate. Dr. Böhm-Bawerk seems to make it the main cause of the demand for capital.

The first criticism upon the new Austrian theory is that if, in truth, men are, in dealing with this matter of the use of capital, habitually giving way to a moral and intellectual weakness, like that of undervaluing the future in comparison with the present, communities thus constituted ought to be growing continually weaker and poorer, like the spendthrift who pays high usury that he may the sooner eat up and drink up and smoke up his ancestral estate. If, on the contrary, the Productivists' view is correct,— namely, that capital bears an interest because its use becomes productive of wealth,— then we have at once an explanation of the origin of interest and of the almost universal phenomenon of the growing wealth and industrial power of communities. But what argument does Dr. Böhm-Bawerk adopt to prove that capital does not, in this sense, produce its own interest?

I answer, first, he seems to think that the burden of proof in this matter is upon those who hold the familiar notion. He says that the Productivists must prove: —

(*a*) That the employment of capital causes a greater amount of goods to be produced: this he calls physical productivity. So much, however, he is willing to concede. This point, then, is not in dispute.

(*b*) That the greater amounts of goods, so produced, have a greater value. While Dr. Böhm-Bawerk severely criticises many writers who have taken for granted the higher value of the larger quantity of goods, he admits that the fact of such superior value is fairly shown. Some of his disciples, however, have chosen to make more of this point than their master, and have written as if the presumption was that the larger amounts would result in no higher, if not, indeed, in a lower aggregate value. Mr. Bonar, in commenting upon this subject, says, "Great quantity and great value are, indeed, almost inconsistent with each other."

(*c*) The last thing which Dr. Böhm-Bawerk declares the Productivists are bound to prove is, not only that the value of the larger amounts of goods produced by the accession of additional amounts of capital will be higher than before, but that this value will be higher by the cost of the capital itself, and by something over, which something over must be the interest. For example, having granted that "the greater amount of goods produced by the help of capital has more value than the smaller amount produced without its help," he adds, "There is not one single feature in the whole circumstances to indicate that this greater amount of goods must be worth more than the capital consumed in its production; and it is this phenomenon of surplus value we have to explain." Please to observe that the larger values produced must at least repay the cost of the capital itself, or there will be no gain, but a loss, through the employment of the

capital. If, in addition to repaying the cost of the capital, those larger values do not also produce a surplus, there can be no interest. In a word, what Dr. Böhm-Bawerk says the Productivists have to show is "the remainder of a net return in the gross return." The fact of a gross return is not questioned. Moreover, Dr. Böhm-Bawerk does not deny that habitually and normally the returns to capital are greater than the cost of capital, which excess is by him, as by us, called Interest. This he admits: There is a surplus value, after paying for the machine or other form of capital used. There is "a net return in the gross return." What he asserts is that this surplus, this net return, cannot be accounted for on the ground of the productiveness of the capital, but must be explained upon his own ground of the undervaluation of future goods, the higher estimation of present goods. Here the issue is joined between Dr Böhm-Bawerk and the Productivists. By what line of reasoning, then, does the Austrian economist undertake to prove that the admitted surplus value, net return, or interest, is not due to the productiveness of the capital, as its sufficient cause?

Dr. Böhm-Bawerk's argument, if I rightly understand it, is this. Whatever be the total "gross uses" of, say, a machine during its life, competition would, on the Productivity theory alone, make this to be the value of the machine at the very beginning of its term of usefulness. If so, there could be no surplus value at the end of that term of use. Therefore, the Productivist theory cannot be true. For example, if a machine had been built at the cost of $50, and the gross uses of the machine through its life, say one year, were to be the value of $53, then there would seemingly be a surplus value of $3. And this, or something like this, the author admits, will normally be the case whenever such a machine is built. Habitually, machines and implements are constructed whose present price is less than is to be the sum of their gross uses. The

difference, the surplus value, the net return, is interest. And this result, of a net return, a surplus value, an interest, is, he says, perfectly explicable on his own theory, because men value, say $53, a year hence, at only $50 to-day. But, aside from the operation of this principle of the normal undervaluation of future goods, the phenomenon of the $3 surplus cannot, he declares, be explained. Remove the operation of that principle, and the present value of that machine would at once necessarily rise to $53, that being the sum of its gross uses, no matter over how long a period protracted. If the machine is going to produce $53 worth sooner or later, it will be worth that sum now.* Therefore, it is the disposition to undervalue future goods which is the cause of interest. But for the productiveness of capital, indeed, interest could not be paid; yet, notwithstanding the productiveness of capital, interest would not be paid,—that is, the present value of the machine would rise to the sum of its gross uses,—were it not for the law of human nature thus invoked.

"Interest," says Dr. Böhm-Bawerk, "is a surplus, a remainder left when product of capital is the minuend and value of consumed capital is the subtrahend. The productive power of capital may find its result in increasing the minuend. But, so far as that goes, it cannot increase the minuend without at the same time increasing the subtrahend in the same proportion. For the productive power is undeniably the ground and measure of the value of the capital in which it resides. If, with a particular form of capital, we can produce nothing, that capital

* "Every good is nothing but the sum of its uses; and the value of a good is the value of all the uses contained in it."

"The productiveness of concrete capital is already discounted in its price."

"To ascribe interest to the productive power of capital is to make a double charge for natural forces, in the price and in the interest."

"The means of production do not account for or measure the value of products. On the contrary, the value of products determines and measures the value of means of production."—*Smart.*

is worth nothing; if we can produce little with it, it is worth little; if we can produce much with it, it is worth much, and so on, capital always increasing in value as the value that can be produced by its help increases,—*i.e.*, as the value of its product increases." And he quotes Menger's proposition, that the value of the means of production (goods of higher rank) is determined,* always and without exception, by the value of their products.

This is Dr. Böhm-Bawerk's proposition, as I understand it. It is to be met by a blunt denial of the assertion that, upon his assumptions, there would be the tendency supposed for the price of the machine to rise to the sum of its gross uses. Why, he asks, should not the machine sell for $53, since it is capable of producing that amount sooner or later? Why, I rejoin, should it do so? There is the best reason in the world why it should not, in that its cost is only $50, and it can be duplicated for that sum. But why, then, asks our author, should not the multiplication of machines bring down the value of the gross uses of each machine from $53 to $50? Because, I answer, men will not buy these machines beyond the point where they can get back the $50 which represents their cost, and also the $3 which represents the productive power of that $50 for one year, which, in other words, is the proper interest on the capital cost of the machine for the term during which it is to be used.

"Why is it," asks Dr. Böhm-Bawerk, "that there is not so great a quantity of any particular form of capital produced and employed that its employment returns just enough to replace the capital, and no more?" I answer, there might be, by misadventure and miscalculation, in the case of "any particular form of capital." But, in regard to capital in general, this can never happen, because the supply of capital, owing to the urgency of human

* "Determined by": yes, unquestionably. But is it necessarily *equal to* the value of the products?

wants for immediate subsistence, can only be slowly and painfully increased; while the demand for it for industrial employment, owing to its productiveness, will always be such as to render it necessary to make provision for a payment to the owner, in the nature of interest, for its use.

It is true that production must take place in time; and, therefore, time is, in that sense, a condition, or, if you please, a cause, of interest. But it is only because time determines how often the productive process can be repeated — how often capital can be "turned over"— that time has to do with interest. Dr. Böhm-Bawerk himself, although he frequently represents the idea of means of production "ripening" into consumption-goods, admits that it is not enough for interest that time should merely elapse. "This is not, of course, to say that, to make present goods out of future goods, it is sufficient that time should elapse and the future become the present. The goods themselves must not remain stationary. On their part, they must bridge over the gap which divides them from the present; and this they do through the production which changes them from goods of remote rank into finished and final products. If there is no productive process, if the capital is left dead, the means of production always remain undervalued future goods."

I confess that it begins to appear to me as if the whole difference were one of phrases only. We say that it is production which creates interest; but we add that the production must of course take place in time. Dr. Böhm-Bawerk declares that time creates the surplus value which becomes interest. But he adds that the lapse of time merely will not do this,— there must be production in that time. It seems, then, that the question is whether we shall attribute the origin of interest to production in time or to time for production. Inasmuch as the production is the essential thing and the passage of time merely a condition, I confess I prefer the former mode of statement.

IV. But one thing more requires to be said. Dr. Böhm-Bawerk is continually making the point against the productivity theory that value does not come from the side of production, but from the side of consumption. "Value," he says, "is not produced, and cannot be produced. What is produced is never anything but forms, shapes of material, combinations of material: that is, things, goods. These goods can of course be goods of value; but they do not bring value with them ready-made, as something inherent that accompanies production. They always receive it first from the outside,—from the wants and satisfactions of the economic world. Value grows, not out of the past of goods, but out of their future. It comes, not out of the workshop where goods come into existence, but out of the wants which those goods will satisfy. . . . What production can do is never anything more than to create goods, in the hope that, according to the anticipated relations of demand and supply, they will obtain value."

If it be true that value does not come from the side of production, equally it is true that value does not come from the side of consumption. It comes from neither, but from both. Value arises from the relations of demand and supply. The desires of the community give rise to economic demand, but it is production which controls supply. Mere desire, or demand, will create no value, any more than will the expenditure of labor upon an object without reference to such desire or demand. Within the past fifteen or twenty years economists have been trying to make up for their previous neglect of consumption, as a department of political economy, by talking about consumption, and little else. A vast deal has been written of late on the theme,—good, bad, and indifferent; but of all the bad things that have been written there is nothing worse than that value comes from the side of consumption alone.

But there is more than this. I am not sure that, after all, it may not be said that, in a certain wide sense, wealth comes from the side of production, consumption — *i.e.*, demand — being assumed as of course. While it is true that in any given case industry may expend itself upon the production of articles which will have no value, yet the desires of men for one kind of article or another are simply illimitable. Possible consumption is always indefinitely beyond the limit of the possibilities of production. Hence, in speaking of the production of wealth in general, not of specific articles, we have the right to take consumption for granted. But capital, except in the case of a few highly specialized instruments, contains a general productive capability, a power importantly to assist in the production of any and every article for which a preference, in the anticipated relations of demand and supply, may exist. Hence we have, it seems to me, the right to say that production, not in every possible case, but in the vast preponderance of all probable cases, will create value,— in the vast preponderance of all actual cases, does create value; and that natural interest represents the capability inhering in capital to assist in such production.

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